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ABSTRACT

Research identified the dimensions (factor structure) of an instrument designed to measure perceptions about adult agricultural education using factor analysis. Objectives were to factor analyze the items comprising the instrument, describe the factors identified, and describe the reliability of the subsets of items that comprise the identified factors. Data were from a study of factors influencing the occurrence of adult agricultural education programs. Nineteen items that measured the perceptions of superintendents, principals, and vocational agriculture instructors toward adult agricultural education programs were used in the factor analysis. Perceptions were measured with a five-point Likert scale. Four factors were identified in the 19-item instrument. The factor structure defined through factor analysis indicated that the instrument measured the following dimensions of the perceptions: benefit, need, instructor, and clientele. Coefficients of internal consistency indicated that the subsets of items measuring each of the four factors were reliable. (YLB)

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Factor Analysis of an Instrument to Measure Perceptions About Adult Agricultural Education Programs.

by

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Research on the perceptions of individuals toward adult agricultural education programs has been conducted for many years. Recent efforts by Krill (1983), Adelaine and Foster (1987), and Christmas (1987) utilized similar instruments to measure the perceptions of decision makers toward adult agricultural education. Each of the instruments used in these investigations purports to measure various domains of interest. To identify and describe the domains of interest (factor structure) of the instruments, additional analysis is needed.

One method for investigating the dimensions (factor structure) of an instrument is factor analysis. Factor analysis is a multivariate statistical technique that allows the investigator to examine the underlying constructs or dimensions of a set of data. Kerlinger (1986, p. 569) states that factor analysis "tells us, in effect, what tests or measures belong together -- which ones virtually measure the same thing, in other words, and how much they do so." Factor analysis is a statistical technique of representing a smaller number of hypothetical variables or factors (Kim and Mueller, 1978). Factor analysis has often been used to assist in the development of research instruments. Recently Darkenwald and Valentine (1985) utilized factor analysis to identify a parsimonious group of factors pertaining to the deterrents to public participation in adult education. In another study Hayes and Darkenwald (1986) used exploratory factor analysis to organize and simplify data in the development of a Deterrents to Participation Scale (DPS-LL).

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Purpose and Objectives

The purpose of this research was to identify the dimensions (factor structure) of an instrument designed to measure perceptions about adult agricultural education using factor analysis. The objectives were to 1) factor analyze the items comprising the instrument, 2) describe the factors identified and 3) describe the reliability of the subsets of items that comprise the identified factors.

Procedures

Data utilized were from a study of factors influencing the occurrence of adult agricultural education prgorams conducted by Christmas (1987). The total number of cases available for analysis was 204. Nineteen items that measured the percetions of superintendents (n=70), principals (n=69) and vocational agriculture instructors (n=65) toward adult agricultural education programs were used in the factor analysis. These perceptions were measured with a 5-point Likert scale ranging from strongly agree (5) to strongly disagree (1). Principal components analysis using varimax rotation and a minimum eigenvalue of 1.0 were set as the preliminary criteria for analysis.

Analysis of Data and Results

The factor analysis with varimax rotation identified four factors with eignvalues exceeding 1.0. Displayed in Table 1 are the four factors that accounted for 55.4 percent of the variance.

Table 1
Statistics Resulting from Varimax Rotation

Factor	Eigenvalue	Percent Variance Explained	Cummulative %
1 (BENEFIT)	6.19	32.6	32.6
2 (NEED)	1.59	8.4	40.9
3 (CLIENTELE)	1.50	7.9	48.8
4 (INSTRUCTOR)	1.26	6.6	55.4

Factor 1 (BENEFIT) includes 8 items that measure the benefits of adult agricultural education programs. The statements comprising the benefit factor are:

B_1 - Adult agricultural programs increase the involvement of local agencies and agricultural organizations, such as the Farm Bureau, Cooperative Extension Service, and banking institutions with the school district (FL=.71).

B_2 - The presence of adult agricultural programs increases support in the school district for school tax levies and bond issues (FL=.70).

*B_3 - Persons enrolled in an adult agricultural program benefit little from their participation (FL=.66).

*B_4 - The teaching of adults by the comprehensive high school vocational agriculture teacher does not make him/her a better high school teacher (FL=.64).

*B_5 - The establishment of adult agricultural programs does not benefit the economic development of the local community (FL=.62).

B_6 - Adults who participate or have participated in adult agricultural programs are stronger supporters of the school than those who do not participate (FL=.62).

B_7 - The comprehensive high school vocational agriculture program benefits from the experiences of the comprehensive high school teacher who also teaches adults (FL=.59).

*B_8 - Having adult agricultural programs in the school creates an unfavorable attitude in the community toward the school (FL=.51).

(* denotes reversed statements, FL = Factor Loading)

Factor 2 (NEED) includes 4 items pertaining to the need for adult agricultural education programs. The statements that comprise the need factor are:

*N_1 - There is considerable duplication of organized agricultural education programs for adults by various organizations or agencies in the school district (FL=.73).

*N_2 - There is little need in this school district for offering an adult agricultural program at the comprehensive high school (FL=.63).

*N_3 - The educational needs of adults employed in agriculture will be provided by other agencies located in this school district if an adult agriucultural program is not offered by the comprehensive high schools (FL=.62).

*N_4 - Adult agricultural programs should not be offered by every scondary school that offers a high school vocational agriculture program (FL=.52).

(* denotes reversed statements, FL=Factor Loading)

Factor 3 (INSTRUCTOR) includes 4 items pertaining to the competence of vocational agriculture instructors to teach adults. The statements that comprise the INSTRUCTOR factor are:

I_1 - Comprehensive high school vocational agriculture teachers have the pedagogical/andragogical skills required to teach adults in agriculture (FL=.75).

I_2 - Comprehensive high school vocational agriuclture teachers have sufficient time, in addition to their responsibilities to the secondary comprehensive high school vocational agriculture program, to teach adults (FL=.69).

*I_3 - Adult agricultural programs should be taught by someone other than the comprehensive high school vocational agriculture instructor (FL=.64)

*I_4 - Comprehensive high school vocational agriculture instructors are not technically competent to instruct adults in agriculture (.51).

(* denotes reversed statements, FL=Factor Loading)

Factor 4 (CLIENTELE) includes three items pertaining to the clientele of adult agricultural education programs. The statements that comprise the CLIENTELE factor are:

C_1 - Adult agricultural education programs should be open only to individuals employed in agriculture who want to improve their occupational skills (FL=.83).

C_2 - Adult agriucultral programs should be open to anyone within the community who desires to enroll (FL=.69).

C_3 - Adult agricultural programs should serve agribusiness employees as well as farmers (FL=.69).

(FL = Factor Loading)

Cronbachs alpha was used to describe the reliability of each of the four subscales (factors). Presented in Table 2 are the reliability coefficients for the four factors for each of the respondent groups and for all respondents.

Table 2
Standardized Cronbach's Alpha Coefficients

Factor	Superintendent	Principal	Instructor	All cases
1 (Benefit)	.81	.89	.79	.84
2 (Need)	.75	.71	.82	.76
3 (Instructor)	.75	.36	.62	.81
4 (Clientele)	.73	.71	.47	.64

For all respondents, reliability coefficients indicating internal consistency of each of the four factors ranged from .64 to .84.

Conclusions and Recommendations

Four factors were identified in the 19-item instrument. The factor structure defined through factor analysis indicates that the instrument measures the following dimensions of the perceptions of superintendents, principals, and vocational agriculture instructors about adult agricultural education programs: Benefit, Need, Instructor and Clientele. Coefficients of internal consistency (Cronbach's Alpha) indicate that the subsets of items measuring each of the four factors are reliable.

It is recommended that researchers use this instrument to investigate the perceptions of school administrators and vocational agriculture instructors about adult agricultural education. Further research is needed to investigate the extent to which the perceptions of school administrators and vocational agriculture instructors about the benefit, need, instructor, and clientele differentiate schools that offer adult education programs from school that do not offer programs and to investigate the relationships between administrators' and teachers' perceptions and the scope and quality of adult agricultural education programs.

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